

# Annals of Neurology

Vol 15 January June 1984

Official Journal of the American Neurological Association and the Child Neurology Society



---

## Editor

Fred Plum, MD, New York Hospital-Cornell  
Medical Center, New York

---

## Associate Editor

Jerome B. Posner, MD, New York

---

## Editor for Neurological Progress

Robert B. Daroff, MD, Cleveland

---

## Editorial Board

Albert J. Aguayo, MD, Montreal  
William E. Bell, MD, Iowa City  
Bruce O. Berg, MD, San Francisco  
Salvatore Di Mauro, MD, New York  
W. Edwin Dodson, MD, St. Louis  
James A. Ferrendelli, MD, St. Louis  
Sid Gilman, MD, Ann Arbor  
Gary W. Goldstein, MD, Ann Arbor  
Donald H. Harter, MD, Chicago  
Asao Hirano, MD, Bronx  
Edwin H. Kolodny, MD, Waltham  
Joseph B. Martin, MD, Boston  
Dale E. McFarlin, MD, Bethesda  
J. G. McLeod, MB, BS, Sydney, Australia  
M.-Marsel Mesulam, MD, Boston  
Marcus E. Raichle, MD, St. Louis  
Herbert H. Schaumburg, MD, Bronx  
Donald H. Silberberg, MD, Philadelphia  
James F. Toole, MD, Winston-Salem  
Joseph J. Volpe, MD, St. Louis  
John N. Whitaker, MD, Memphis  
Jerry S. Wolinsky, MD, Houston  
Robert R. Young, MD, Boston  
David S. Zee, MD, Baltimore

---

## Editorial Assistant

Nancy Marmor, New York

---

## Publisher

Little, Brown and Company, Boston

## Manager, Medical Journals

Carol Rougie

---

ISSN 0364-5134. Published monthly by Little, Brown and Company, 34 Beacon Street, Boston, MA 02106. All rights reserved. Except as authorized in the accompanying statement, no part of *Annals of Neurology* may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without the publisher's written permission. Subscription rates per year: Personal subscription, US and possessions, \$57.50; foreign (includes Canada and Mexico), \$72.50; Institutional, US, \$69.50; foreign, \$84.50. Special rates for students, interns, and residents per year: US, \$47.50; foreign, \$62.50. Single copies \$7.00 prepaid. In the United Kingdom please contact our exclusive agent: Baillière Tindall, Journals Subscription Department, 1 St. Anne's Rd, Eastbourne, E. Sussex BN21 3UN, England. In Japan please contact our exclusive agent: Nankodo Company Limited, 42-6, Hongo 5-chome, Bunkyo-ku, Tokyo 113, Japan. Bound Volumes: Nos 15 and 16 will be available in 1984. Contact Publisher for more information. Second-class postage paid at Boston, MA, and at additional mailing offices. Copyright © 1984 by the American Neurological Association. POSTMASTER: Send address changes to *Annals of Neurology*, 34 Beacon St, Boston, MA 02106.

---

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by the American Neurological Association for libraries and other users registered with the Copyright Clearance Center Transactional Reporting Service, provided that the per-copy fee of \$1.50 is paid directly to the Copyright Clearance Center, 21 Congress St, Salem, MA 01970, for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. The code fee for this journal is 0364-5134/84 \$1.50. This authorization does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copying fees for material published in this journal prior to January 1, 1978 will be charged according to fee rates on file with the Copyright Clearance Center, Inc.

---

- 1 Editor's Note  
*Fred Plum, MD*

## Neurological Progress

- 2 Diabetic Neuropathy  
*Mark J. Brown, MD, and Arthur K. Asbury, MD*

## Original Articles

- 13 Hereditary Form of Sustained Muscle Activity of Peripheral Nerve Origin Causing Generalized Myokymia and Muscle Stiffness  
*Raymond G. Auger, MD, FRCP(C), Jasper R. Daube, MD, Manuel R. Gomez, MD, and Eduard H. Lambert, MD, PhD*
- 22 Extraction of Clinical Information from Electroencephalographic Background Activity: The Combined Use of Brain Electrical Activity Mapping and Intravenous Sodium Thiopental  
*Frank H. Duffy, MD, Frances Jensen, MD, Giuseppe Erba, MD, James L. Burchfiel, PhD, and Cesare T. Lombroso, MD*
- 31 Resumption of Behavior Following Intracarotid Sodium Amobarbital Injection  
*Rebecca Rausch, PhD, Paul Fedio, PhD, Catherine M. Ary, BS, Jerome Engel, Jr. MD, PhD, and Paul H. Crandall, MD*
- 36 Hyperekplexia: A Syndrome of Pathological Startle Responses  
*E. Sáenz-Lope, MD, F. J. Herranz-Tanarro, MD, J. C. Masdeu, MD, and J. R. Chacón Peña, MD*
- 42 Calcium and Vitamin D Metabolism in Guamanian Chamorros with Amyotrophic Lateral Sclerosis and Parkinsonism-Dementia  
*Richard Yanagibara, MD, Ralph M. Garruto, PhD, D. Carleton Gajdusek, MD, Akio Tomita, MD, Takashi Uchikawa, MD, Yoko Konagaya, MD, Kwang-Ming Chen, MD, Itsuro Sobue, MD, Chris C. Plato, PhD, and Clarence J. Gibbs, Jr. PhD*
- 49 A Progressive Familial Encephalopathy in Infancy with Calcifications of the Basal Ganglia and Chronic Cerebrospinal Fluid Lymphocytosis  
*J. Aicardi, MD, and F. Goutières, MD*
- 55 Spinal Somatosensory Evoked Potentials in Juvenile Diabetes  
*Joan Cracco, MD, Salvador Castells, MD, and Erna Mark, MD*
- 59 High Blood Glucose Level on Hospital Admission and Poor Neurological Recovery After Cardiac Arrest  
*W. T. Longstreth, Jr. MD, and Thomas S. Inui, MD*

- 64 Selective Memory Improvement and Impairment in Temporal Lobectomy for Epilepsy  
*Robert A. Novelly, PhD, Elizabeth A. Augustine, PhD, Richard H. Mattson, MD, Gilbert H. Glaser, MD, Peter D. Williamson, MD, Dennis D. Spencer, MD, and Susan S. Spencer, MD*
- 68 Occupational Adjustment Following Neurosurgical Treatment of Epilepsy  
*Elizabeth A. Augustine, PhD, Robert A. Novelly, PhD, Richard H. Mattson, MD, Gilbert H. Glaser, MD, Peter D. Williamson, MD, Dennis D. Spencer, MD, and Susan S. Spencer, MD*
- 73 Collateral Reinnervation of Sweat Glands  
*William R. Kennedy, MD, and Manabu Sakuta, MD*
- 79 The Lymphoproliferative Response to Measles Virus in Twins with Multiple Sclerosis  
*Jeffrey I. Greenstein, MD, Henry F. McFarland, MD, Elizabeth S. Mingioli, BA, and Dale E. McFarlin, MD*
- 88 Dysautonomia in Guillain-Barré Syndrome with Dorsal Root Ganglioneuropathy, Wallerian Degeneration, and Fatal Myocarditis  
*Andrew K. Hodson, MB, MRCP(UK), Barrie J. Hurwitz, MB, MRCP(UK), FCP(SA), and Renata Albrecht, MD*
- 96 Response of C-6 Glioma to Isoproterenol and Papaverine In Vivo Depends on  $\beta$ -Adrenergic Receptor Density  
*Ewa Chelwicka-Schorr, MD, Michael G. Sportiello, BS, Samir F. Atweh, MD, and Barry G. W. Arnason, MD*

## Brief Communications and Case Reports

- 100 Encephalopathy Following Arteriography: A Possible Toxic Effect of Contrast Agents  
*E. Clarke Haley, Jr. MD*
- 102 Brain Trace Elements in Pick's Disease  
*W. D. Ehmann, PhD, M. Alauddin, PhD, T. I. M. Hossain, PhD, and W. R. Markesbery, MD*
- 104 Biochemical Studies of Pyridoxal and Pyridoxal Phosphate Status and Therapeutic Trial of Pyridoxine in Patients with Carpal Tunnel Syndrome  
*Gillian P. Smith, PhD, P. J. Rudge, FRCP, and T. J. Peters, FRCP*
- 107 Creutzfeldt-Jakob Disease: A Case of 16 Years' Duration  
*Neal R. Cutler, MD, Paul W. Brown, MD, Tina Narayan, MD, Joseph E. Parisi, MAJ, MC, USA, Frank Janotta, MD, and Henry Baron, MD*

## Letters

- 111 Permanent Neurological Deficits Resulting from Lithium Toxicity  
*Joseph B. Green, MD*

- 111 **Decreased Serum Creatine Kinase Activity in Patients Receiving Parenteral Nutrition**  
*Amin A. Nanji, MD, FRCP(C), and Frank H. Anderson, MD, FRCP(C)*
- 
- 112 **Some Notes on Making the Diagnosis of Multiple Sclerosis**  
*Augustus S. Rose, MD*
- 112 **Reply**  
*Charles M. Poser, MD*
- 
- 112 **Disturbance of Regulatory Lymphocyte Subsets in Polymyositis**  
*Wilhelmina M. H. Behan, MB, ChB, FRCPath, and Peter O. Behan, MD, FACP, FRCP(Lond, Glasg, I)*
- 114 **Reply**  
*Alexander R. Lawton, MD, and Gerald M. Fenichel, MD*
- 
- 114 **Intracerebral Hemorrhage and Vasculitis Related to Ephedrine Abuse**  
*Stephen E. Nadeau, MD*
- 115 **Reply**  
*Marvin R. Wooten, MD, and Martin J. Murphy, MD*
- 
- 115 **Apraxia of Eyelid Opening in Progressive Supranuclear Palsy**  
*I. Debaene, MD*
- 115 **Reply**  
*Joseph Jankovic, MD*
- 
- 116 **Concerning Progression of Carotid Disease after Endarterectomy**  
*J. F. Vollmar, MD*
- 117 **Reply**  
*Bo Norrving, MD*
- 
- Regular Departments**
- 118 **Books**
- 

## NO 2 FEBRUARY 1984

### Conference Report

- 119 **Detection of Viral Genes and Their Products in Chronic Neurological Diseases**  
*Ashley T. Haase, MD, J. Pagano, MD, Byron Wakeman, MD, and Neal Nathanson, MD*

### Original Articles

- 122 **Comparison of Cognitive Ability, Personality Profile, and School Success in Epileptic Children with Pure Right Versus Left Temporal Lobe EEG Foci**  
*Peter R. Camfield, MD, Robert Gates, PhD, Gabriel Ronen, MD, Carol Camfield, MD, Anne Ferguson, MA, and G. Wayne MacDonald, PhD*
- 127 **Age at Onset of Seizures in Young Children**  
*Jonas H. Ellenberg, PhD, Deborah G. Hirtz, MD, and Karin B. Nelson, MD*
- 
- 135 **Deafness in Cockayne's Syndrome: Morphological, Morphometric, and Quantitative Study of the Auditory Pathway**  
*A. Gandolfi, MD, D. Horoupian, MD, I. Rapin, MD, R. DeTeresa, BS, and V. Hyams, MD*
- 
- 144 **Neurological Disorders Associated with Deficiency of Glutamate Dehydrogenase**  
*Andreas Plaitakis, MD, Soll Berl, MD, and Melvin D. Yahr, MD*
- 
- 154 **Huntington's Disease: Survival of Large Striatal Neurons in the Rigid Variant**  
*Orso Bugiani, MD, Massimo Tabaton, MD, and Sergio Cammarata, MD*
- 

- 157 **Whole Body Insulin Resistance in Myotonic Dystrophy**  
*Richard T. Moxley, MD, Alastair J. Corbett, MD, Kenneth L. Minaker, MD, and John W. Rowe, MD*
- 
- 163 **Demyelination Induced by Serum from Patients with Guillain-Barré Syndrome**  
*B. M. Harrison, PhD, L. A. Hansen, BA, J. D. Pollard, FRACP, and J. G. McLeod, FRACP*
- 
- 171 **Human Alpha-Fetoprotein-Rich Fraction Inhibits Galactocerebroside Antibody-Mediated Lysis of Oligodendrocytes In Vitro**  
*Isabelle Lubetzki-Korn, MD, Mikio Hirayama, MD, Donald H. Silberberg, MD, Alan D. Schreiber, MD, P. Ann Eccleston, David Pleasure, MD, Talma Brenner, PhD, and Oded Abramsky, MD, PhD*
- 
- 181 **Carrier Detection of Sialidosis with Partial  $\beta$ -Galactosidase Deficiency by the Assay of Lysosomal Sialidase in Lymphocytes**  
*Shoji Tsuji, MD, Takamichi Yamada, PhD, Toshio Ariga, PhD, Itaru Toyoshima, MD, Haruyasu Yamaguchi, MD, Yoshisuke Kitahara, MD, Tadashi Miyatake, MD, and Tamio Yamakawa, MD*
- 
- 184 **Central Nervous System Catecholamine Metabolism in Korsakoff's Psychosis**  
*Peter R. Martin, MD, FRCP(C), Herbert Weingartner, PhD, Edna K. Gordon, BS, R. Stanley Burns, MD, Markku Linnoila, MD, PhD, Irwin J. Kopin, MD, and Michael H. Ebert, MD*
-

- 188 Pulmonary Lymphatic Flow Alterations During Intracranial Hypertension in Sheep  
*R. P. Simon, MD, and L. L. Bayne, BA*

- 195 Enzyme-Linked Immunosorbent Assay for Antibody Against the Nicotinic Acetylcholine Receptor in Human Myasthenia Gravis  
*Sachiko Kawanami, MD, Rieko Tsuji, BS, and Kenichiro Oda, MD*

## Brief Communications and Case Reports

- 201 Neurodevelopmental Outcome of Survivors with Posthemorrhagic Hydrocephalus Following Grade II Neonatal Intraventricular Hemorrhage  
*K. S. Krishnamoorthy, MD, K. J. Kuehne, EdD, I. D. Todres, MD, and G. R. DeLong, MD*
- 204 Bilateral Carotid Artery Occlusion Resulting from Giant Cell Arteritis  
*George F. Howard III, MD, Sam U. Ho, MD, Kwang S. Kim, MD, and Jami Wallach, MD*

## Obituary

- 208 Morris B. Bender, 1905-1983  
*Bernard Cohen, MD*

## Notes and Letters

- 210 Long-term Administration of Oral Physostigmine and Lecithin Improve Memory in Alzheimer's Disease  
*Harvey S. Levin, PhD, and Bruce H. Peters, MD*
- 210 Reply  
*L. J. Thal, MD, P. A. Fuld, PhD, D. M. Masur, MS, and N. S. Sharpless, PhD*
- 210 Partial Elementary Motor Seizures as the First Symptom of Creutzfeldt-Jakob Disease  
*Keith Aronik, MD, Frank Petito, MD, and Gail E. Solomon, MD*
- 211 Care of the Patient with Stroke  
*Bruce D. Snyder, MD*
- 212 Steroid-Responsive Postinfectious Sensorineural Hearing Loss  
*Naomi Amir, MD, Ruth S. Shalev, MD, Miriam Berman, MD, Aryeh Gilai, PhD, and Joseph Mor, MD*
- 213 Mononeuritis Multiplex Following Jellyfish Stings  
*Michele R. Filling-Katz, MD*
- 214 Lithium and Parkinsonism  
*Anthony E. Lang, MD, FRCP(C)*

## Regular Departments

- 215 Books

## NO 3 MARCH 1984

## Original Articles

- 217 A Quantitative Model for the In Vivo Assessment of Drug Binding Sites with Positron Emission Tomography  
*Mark A. Mintun, MD, Marcus E. Raichle, MD, Michael R. Kilbourn, PhD, G. Frederick Wooten, MD, and Michael J. Welch, PhD*
- 228 Pure Hemidystonia with Basal Ganglion Abnormalities on Positron Emission Tomography  
*Joel S. Perlmutter, MD, and Marcus E. Raichle, MD*
- 234 Effect of Baclofen on Sleep-Related Periodic Leg Movements  
*Christian Guilleminault, MD, and Wayne Flagg, MS*
- 240 Baclofen in the Treatment of Trigeminal Neuralgia: Double-Blind Study and Long-Term Follow-up  
*Gerhard H. Fromm, MD, Christopher F. Terrence, MD, and Amrik S. Chatterja, MD*
- 245 Medulassin Activity in Granulocytes of Patients with Multiple Sclerosis  
*Yosuke Aoki, MD, Tadasbi Miyatake, MD, Natsue Shimizu, MD, and Mitsuo Yoshida, MD*
- 250 A Serial Study of Peripheral Blood T Lymphocyte Subsets in Relapsing-Remitting Multiple Sclerosis  
*Lorne F. Kastrukoff, MD, and Donald W. Paty, MD*
- 257 Effect of High-Dose Intravenous Steroid Administration on Contrast-Enhancing Computed Tomographic Scan Lesions in Multiple Sclerosis  
*Raymond Troiano, MD, Marino Hafstein, MD, Marvin Ruderman, MD, Peter Dowling, MD, and Stuart Cook, MD*
- 264 Elevated Neutral Protease Activity in Myelin from Brains of Patients with Multiple Sclerosis  
*Shuzo Sato, MD, Richard H. Quarles, PhD, Roscoe O. Brady, MD, and Wallace W. Tourtellotte, MD, PhD*

- 268 **Use of a Heparinoid in Patients with Hemorrhagic Stroke and Thromboembolic Disease**  
H. Ten Cate, MC, C. P. Henny, MC,  
H. R. Büller, MD, PhD, J. W. Ten Cate, MD, PhD,  
and H. N. Magnani, MB, BS, MSc, PhD
- 271 **Levels of Adenylate Deaminase, Adenylate Kinase, and Creatine Kinase in Frozen Human Muscle Biopsy Specimens Relative to Type 1/Type 2 Fiber Distribution: Evidence for a Carrier State of Myoadenylate Deaminase Deficiency**  
William N. Fishbein, MD, PhD,  
Vernon W. Armbrustmacher, MD,  
Joe L. Griffin, PhD, John I. Davis, BA,  
and Walter D. Foster, PhD
- 278 **Amyloid Plaques in the Brains of Mice with Creutzfeldt-Jakob Disease**  
Jun Tateishi, MD, Hitoshi Nagara, MD,  
Koburo Hikiita, MD, and Yuji Sato, MD
- 281 **Neglect in Children**  
José M. Ferro, MD, Isabel Pavão Martins, MD,  
and Luis Távora, MD
- 285 **Outcome of Neonatal Intraventricular Hemorrhage with Periventricular Echodense Lesions**  
Joseph B. McMennamin, MB,  
Gary D. Shackelford, MD, and Joseph J. Volpe, MD
- 291 **Long-Term Corticosteroid Treatment of Myasthenia Gravis: Report of 116 Patients**  
Robert M. Pascuzzi, MD, H. Branch Coslett, MD,  
and T. R. Johns, MD

## Brief Communications and Case Reports

- 299 **Mirror Movement: Application of Movement-Related Cortical Potentials**  
Hiroshi Shibasaki, MD, and Kazuhisa Nagae, MD

- 302 **Hypothalamic Mass and Gigantism in Neurofibromatosis: Treatment with Bromocriptine**  
Michael S. Duchowny, MD, Raananab Katz, MD,  
and Rafael L. Bejar, MD
- 304 **Transfer of Language Dominance**  
Henry Lee, MD, Tsutomu Nakada, MD,  
Jon L. Deal, PhD, Stan Lin, MD,  
and Ingrid L. Kwee, MD

## Letters

- 308 **Lack of Clinical Benefit from Naloxone in a Dementia Day Hospital**  
John J. Panella, Jr, MSG,  
and John P. Blass, MD, PhD
- 309 **Motion Sickness in Children with Tourette's Syndrome**  
Gabor Barabas, MD, Wendy S. Matthews, PhD,  
and Michael Ferrari, PhD
- 309 **Nuclear Magnetic Resonance versus Computerized Tomographic Enhancement Imaging in Multiple Sclerosis: An Apples and Oranges Comparison?**  
E. Simon Sears, MD
- 310 **Reply**  
David Norman, MD,  
and Michael J. Aminoff, MD
- 311 **Angiographic Changes in Intracranial Arteritis of Ophthalmic Herpes Zoster**  
David G. Fryer, MD, Robert Crane, MD,  
and M. Theodore Margolis, MD
- 312 **Computed Tomography in Acute Hemorrhagic Leukoencephalitis**  
Ted L. Rothstein, MD,  
and Cheng-Mei Shaw, MD

## Regular Departments

- 239 **Erratum**

## NO 4 APRIL 1984

### Hypothesis

- 313 **Central Distal Axonopathy Syndromes: Newly Recognized Models of Naturally Occurring Human Degenerative Disease**  
P. K. Thomas, MD, DSc, H. H. Schaumburg, MD,  
P. S. Spencer, PhD, MRCPath, H. E. Kaeser, MD,  
C. A. Pallis, MD, FRCP,  
F. Clifford Rose, MD, FRCP,  
and N. H. Wadia, MD

### Original Articles

- 316 **Neuronal Intranuclear Inclusion Disease in Identical Twins**  
Matti Haltia, MD, Hannu Somer, MD,  
Jorma Palo, MD, and William G. Johnson, MD

- 322 **Neurofilament Subunit-Related Proteins in Neuronal Intranuclear Inclusions**  
Jorma Palo, MD, Matti Haltia, MD,  
Stirling Carpenter, MD, George Karpati, MD,  
and Walter Mushynski, PhD
- 329 **Chromatin Structure in Dementia**  
D. R. Crapper McLachlan, MD, FRCP(C),  
P. N. Lewis, PhD, W. J. Lukiw, BSc,  
A. Sima, MD, FRCP(C),  
C. Bergeron, MD, FRCP(C), and U. De Boni, PhD
- 335 **Alzheimer's Disease: A Study of Epidemiological Aspects**  
Albert Heyman, MD, William E. Wilkinson, PhD,  
Judith A. Stafford, MS, Michael J. Helms, BS,  
Alverta H. Sigmon, and Tina Weinberg, BS



- 342 Effects of Hypoxia-Ischemia on Monoamine Metabolism in the Immature Brain  
*Faye Silverstein, MDCM, and Michael V. Johnston, MD*
- 
- 348 Juvenile Progressive Dystonia: A New Phenotype of  $G_{M2}$  Gangliosidosis  
*David Meek, MD, FRCP(C), Leonhard S. Wolfe, MD, PhD, Eva Andermann, MD, PhD, and Frederick Andermann, MD, FRCP(C)*
- 
- 353 Measles Encephalomyelitis: Lack of Evidence of Viral Invasion of the Central Nervous System and Quantitative Study of the Nature of Demyelination  
*Howard E. Gendelman, MD, Jerry S. Wolinsky, MD, Richard T. Johnson, MD, Norman J. Pressman, PhD, Gholam H. Pezesbkpour, MD, and Gerardo F. Boisset, MD*
- 
- 361 Opioid-Induced Epileptogenic Phenomena: Anatomical, Behavioral, and Electroencephalographic Features  
*Harry T. Chugani, MD, Robert F. Ackermann, PhD, Diane C. Chugani, BA, and Jerome Engel, Jr. MD, PhD*
- 
- 369 Autosomal Dominant Inheritance of Hereditary Canine Spinal Muscular Atrophy  
*George H. Sack, Jr. MD, PhD, Linda C. Cork, DVM, PhD, Jeanette M. Morris, John W. Griffin, MD, and Donald L. Price, MD*
- 
- 374 Hypometric Saccades and Low-Gain Pursuit Resulting from a Thalamic Hemorrhage  
*Mitchell Brigell, PhD, Viken Babikian, MD, and James A. Goodwin, MD*
- 
- 379 Nonhemorrhagic Venous Infarction of the Spinal Cord  
*R. C. Kim, MD, H. R. Smith, MD, M. L. Henbest, MD, and B. H. Choi, MD*
- 
- 386 Microangiopathy of Vasa Nervorum in Dysglobulinemic Neuropathy  
*Henry C. Powell, MB, BCh, Moses Rodriguez, MD, and Richard A. C. Hughes, MD, FRCP*
- 

## Brief Communications and Case Reports

- 395 IgM Demyelinative Neuropathy with Amyloidosis and Biclinal Gammopathy  
*J. Julien, MD, C. Vital, MD, J. M. Vallat, MD, A. Lagueny, MD, X. Ferrer, MD, C. Deminiere, MD, M. J. Leboutet, MD, and C. Effroy, MD*
- 
- 400 Exacerbation of Myasthenia Gravis after Removal of a Thymoma Having a Membrane Phenotype of Suppressor T Cells  
*Yasuo Kuroda, MD, Ken-ichiro Oda, MD, Ryuji Nishige, MD, and Hiroshi Shibasaki, MD*
- 

## Letters

- 403 Ophthalmoplegic Polyneuropathy: Another Case in Association with Epstein-Barr Virus  
*Robin L. Brey, MD*
- 
- 403 Clinical Differences Among Types of Dementia  
*D. Frank Benson, MD*
- 
- 404  $Na^+$ - and  $K^+$ -Dependent Adenosine Triphosphatase and Multiple Sclerosis  
*Margaret M. Esiri, MD*
- 
- 404 Reply  
*Hilde E. Hirsch, PhD*
- 
- 405 N,N-Dimethylglycine Shows No Anticonvulsant Potential  
*Dan Haidukewych, PhD, and Ernst A. Rodin, MD*
- 
- 406 Brainstem Auditory Evoked Potentials Are Normal in Idiopathic Sleep Apnea  
*Dean Karnaze, MD, Peggy Gott, PhD, Frank Mitchell, R EEG T, and James Loftin, MD*
- 

## Regular Departments

- 407 Books
- 

## SUPPLEMENT: RESEARCH ISSUES IN POSITRON EMISSION TOMOGRAPHY

---

### ii Preface

### Models and Technology Used in Positron Emission Tomography

- S1 Modeling Metabolic Processes in the Brain In Vivo  
*Louis Sokoloff, MD*
- 
- S12 Emission Tomographic Measurement of Local Cerebral Blood Flow in Humans by an In Vivo Autoradiographic Strategy  
*Myron D. Ginsberg, MD, Bernard E. Howard, PhD, and William R. Hassel, MS*
- 

- S19 Cyclotrons, Radionuclides, Precursors, and Demands for Routine versus Research Compounds  
*Alfred P. Wolf, PhD*
- 

- S25 Prospects for Both Precision and Accuracy in Positron Emission Tomography  
*Edward J. Hoffman, PhD, Maurice van der Stee, MS, Anthony R. Ricci, BS, and Michael E. Phelps, PhD*
- 

- S35 Instrumentation for Positron Emission Tomography  
*Thomas F. Budinger, MD, PhD, Stephen E. Derenzo, PhD, and Ronald H. Huesman, PhD*
-

- S44 **Summary of Discussion: Models and Technology Used in Positron Emission Tomography**  
*Alfred P. Wolf, PhD,*  
*and Thomas F. Budinger, MD, PhD*

## Normal Physiology as Defined by Positron Emission Tomography

- S46 **Dynamic Cerebral Positron Emission Tomographic Studies**  
*Michel M. Ter-Pogossian, PhD, David C. Ficke, MS, Mark A. Mintun, MD, Peter Herscovitch, MD, Peter T. Fox, MD, and Marcus E. Raichle, MD*
- S48 **Dynamic Measurements of Local Blood Flow and Metabolism in the Study of Higher Cortical Function in Humans with Positron Emission Tomography**  
*Marcus E. Raichle, MD, Peter Herscovitch, MD, Mark A. Mintun, MD, W. R. Wayne Martin, MD, and William Powers, MD*
- S50 **Human Sensory Stimulation and Deprivation: Positron Emission Tomographic Results and Strategies**  
*John C. Mazziotta, MD, PhD, and Michael E. Phelps, PhD*
- S61 **Positron Emission Tomographic Studies of Perceptual Tasks**  
*M. Reivich, MD, A. Alavi, MD, and R. C. Gur, PhD*
- S66 **Measurements In Vivo of Parameters of the Dopamine System**  
*A. M. Friedman, PhD, O. T. DeJesus, PhD, J. Revenagh, BA, and R. J. Dinerstein, MD, PhD*
- S77 **[<sup>18</sup>F]Spiroperidol: A Radiopharmaceutical for the In Vivo Study of the Dopamine Receptor**  
*Michael J. Welch, PhD, Marcus E. Raichle, MD, Michael R. Kilbourn, PhD, and Mark A. Mintun, MD*
- S79 **Assessment of Dopamine Receptor Densities in the Human Brain with Carbon-11-Labeled N-Methylspiperone**  
*Henry N. Wagner, Jr. MD, H. Donald Burns, PhD, Robert F. Dannals, PhD, Dean F. Wong, MD, Bengt Langström, PhD, Timothy Duelfer, PhD, J. James Frost, MD, PhD, Hayden T. Ravert, PhD, Jonathan M. Links, PhD, Shelley B. Rosenbloom, MD, Scott E. Lukas, MD, Alfred V. Kramer, PhD, and Michael J. Kuhar, PhD*
- S85 **In Vivo Studies of Opiate Receptors**  
*J. James Frost, MD, PhD, Robert F. Dannals, PhD, Timothy Duelfer, PhD, H. Donald Burns, PhD, Hayden T. Ravert, PhD, Bengt Langström, PhD, V. Balasubramanian, PhD, and Henry N. Wagner, Jr. MD*
- S93 **A Regional Metabolic Contrast Method for the Study of Brain Pathology**  
*Bernard W. Agranoff, MD, and Kirk A. Frey, SB*

- S98 **In Vivo Measurement of Regional Brain Tissue pH Using Positron Emission Tomography**  
*D. A. Rottenberg, MD, J. Z. Ginos, PhD, K. J. Kearfott, ScD, L. Junck, MD, and D. D. Bigner, MD*

- S103 **Functional Evaluation of the Blood-Brain Barrier Using Positron Emission Tomography**  
*Alan H. Lockwood, MD*

- S107 **Radiation Absorbed Dose to Tracheal Mucosa from Inhaled Oxygen-15-Labeled Carbon Dioxide**  
*G. F. Powell, MS, R. A. Schuchard, MS, C. S. Reft, PhD, and P. V. Harper, MD*

- S110 **Summary of Discussion: Normal Physiology As Defined by Positron Emission Tomography**  
*Henry N. Wagner, Jr. MD, and J. James Frost, MD, PhD*

## Positron Emission Tomography of Abnormal and Diseased States, I

- S112 **Positron Emission Tomographic Studies in Aging and Cerebrovascular Disease at Hammersmith Hospital**  
*Richard S. J. Frackowiak, MD, Richard J. S. Wise, MRCP, Jeremy M. Gibbs, MRCP, and Terry Jones, MSc*
- S119 **Patterns of Cerebral Glucose Utilization in Parkinson's Disease and Huntington's Disease**  
*David E. Kuhl, MD, E. Jeffrey Metter, MD, Walter H. Riege, PhD, and Charles H. Markham, MD*
- S126 **Positron Imaging in Ischemic Stroke Disease**  
*Robert H. Ackerman, MD, Nathaniel M. Alpert, PhD, John A. Correia, PhD, Seth Finklestein, MD, Stephen M. Davis, MD, Roger E. Kelley, MD, Geoffrey A. Donnan, MD, Joseph G. D'Alton, MD, and Juan M. Taveras, MD*
- S131 **Parkinson's Disease: Metabolic and Pharmacological Approaches with Positron Emission Tomography**  
*Marcus E. Raichle, MD, Joel S. Perlmutter, MD, and Peter T. Fox, MD*
- S133 **The Effect of Normal Aging on Patterns of Local Cerebral Glucose Utilization**  
*David E. Kuhl, MD, E. Jeffrey Metter, MD, Walter H. Riege, PhD, and Randall A. Hawkins, MD*
- S138 **Issues in the In Vivo Measurement of Glucose Metabolism of Human Central Nervous System Tumors**  
*Giovanni Di Chiro, MD, Rodney A. Brooks, PhD, Nicholas J. Patronas, MD, Dikran Bairamian, MD, Paul L. Kornblith, MD, Barry H. Smith, MD, Luigi Mansi, MD, and John Barker*
- S147 **Summary of Discussion: Positron Emission Tomography of Abnormal and Diseased States, I**  
*David E. Kuhl, MD*

## Positron Emission Tomography of Abnormal and Diseased States, II

- S149** Positron Emission Tomographic Study of Affective Disorders: Problems and Strategies  
Michael E. Phelps, PhD,  
John C. Mazziotta, MD, PhD, Lewis Baxter, MD,  
and Robert Gerner, MD
- 
- S157** Positron Emission Tomographic Image Measurement in Schizophrenia and Affective Disorders  
Monte S. Buchsbaum, MD, J. Cappelletti, Ron Ball, E. Hazlett, A. C. King, J. Johnson, PhD, J. Wu, MD, and Lynn E. DeLisi, MD
- 
- S166** Patterns of Metabolic Activity in the Treatment of Schizophrenia  
Jonath. in D. Brodie, MD, PhD,  
David R. Christman, PhD, Juan F. Corona, PhD, Joanna S. Fowler, PhD, Francisco Gomez-Mont, MD, Judith Jaeger, MA, Peter A. Michaels, MA, John Rotrosen, MD, Jerome A. Russell, PhD, Nora D. Volkow, MD, Alan Wikler, MA, Alfred P. Wolf, PhD, and Adam Wolkin, MD
- 
- S170** Regional Cortical Dysfunction in Alzheimer's Disease As Determined by Positron Emission Tomography  
Thomas N. Chase, MD, Norman L. Foster, MD, Paul Fedio, PhD, Rodney Brooks, PhD, Luigi Mansi, MD, and Giovanni Di Chiro, MD
- 

- S175** Gilles de la Tourette Syndrome: Studies with the Fluorine-18-Labeled Fluorodeoxyglucose Positron Emission Tomographic Method  
Thomas N. Chase, MD, Norman L. Foster, MD, Paul Fedio, PhD, Rodney Brooks, PhD, Luigi Mansi, MD, Robert Kessler, MD, and Giovanni Di Chiro, MD
- 
- S176** The Role of Positron Emission Tomography in the Evaluation of Seizure Disorders  
William H. Theodore, MD, Rodney Brooks, PhD, Susumu Sato, MD, Nicholas Patronas, MD, Richard Margolin, MD, Giovanni Di Chiro, MD, and Roger J. Porter, MD
- 
- S180** The Use of Positron Emission Tomographic Scanning in Epilepsy  
Jerome Engel, Jr, MD, PhD
- 
- S192** Criteria for the Tracer Kinetic Measurement of Cerebral Protein Synthesis in Humans with Positron Emission Tomography  
M. E. Phelps, PhD, J. R. Barrio, PhD, S.-C. Huang, DSc, R. E. Keen, BA, H. Chugani, MD, and J. C. Mazziotta, MD, PhD
- 
- S203** Summary of Discussion: Positron Emission Tomography of Abnormal and Diseased States, II  
M. Reivich, MD
- 

## NO 5 MAY 1984

## Neurological Progress

- 409** Severe Neurological Impairment: Legal Aspects of Decisions to Reduce Care  
H. Richard Beresford, MD, JD
- 

## Original Articles

- 415** Parkinson's Disease: Neuron Loss in the Nucleus Basalis Without Concomitant Alzheimer's Disease  
Imabaru Nakano, MD, and Asao Hirano, MD
- 
- 419** Patterns of Local Cerebral Glucose Utilization Determined in Parkinson's Disease by the [<sup>18</sup>F]Fluorodeoxyglucose Method  
David E. Kuft, MD, E. Jeffrey Metter, MD, and Walter H. Riege, PhD
- 
- 425** Contralateral Cerebellar Hypometabolism Following Cerebral Insult: A Positron Emission Tomographic Study  
Michael Kushner, MD, Abass Alavi, MD, Martin Reivich, MD, Robert Dann, BS, Allan Burke, MD, and Gerald Robinson, PhD
- 
- 435** Cerebrospinal Fluid Vasopressin and Increased Intracranial Pressure  
Per Soelberg Sørensen, MD, Flemming Gjerris, MD, and Mogens Hammer, MD
- 
- 441** Regional Blood Flow in Compression-Induced Brain Edema in Rats: Effect of Dietary Vitamin E  
Raul Busto, BS, Shinichi Yoshida, MD, Myron D. Ginsberg, MD, Ofelia Alonso, David W. Smith, BS, and William J. Goldberg, PhD
- 
- 449** Axolemma Is a Mitogen for Human Schwann Cells  
Gen Sobue, MD, Mark J. Brown, MD, Seung U. Kim, MD, PhD, and David Pleasure, MD
- 
- 453** Severe Neurological Disease Associated with Hyperparathyroidism  
Bernard M. Patten, MD, and Michel Pages, MD
- 
- 457** Painful Lumbosacral Plexopathy with Elevated Erythrocyte Sedimentation Rate: A Treatable Inflammatory Syndrome  
Walter G. Bradley, DM, FRCP, David Chad, MD, FRCP(C), Jacob P. Verghese, MD, Hsiu-Chih Liu, MD, Paul Good, BS, Alberto A. Gabbai, MD, and Lester S. Adelman, MD
- 
- 465** Eye Movements Induced by Head Rotation in Unresponsive Patients  
R. John Leigh, MD, Daniel F. Hanley, MD, Frederick E. Munschauer III, MD, and Adrian G. Lasker, MS
-



- 474 **Rebound Nystagmus in Olivocerebellar Atrophy: A Clinicopathological Correlation**  
*Roberta L. Bondar, PhD, MD, James A. Sharpe, MD, and Anthony J. Lewis, MB, BS*
- 

- 478 **Lymphomatoid Granulomatosis with Isolated Involvement of the Brain**  
*Brian J. Schmidt, MD, Kathleen Meagher-Villemure, MD, and Jaime Del Carpio, MD*
- 

- 482 **Quantitation of the Sweating Deficiency in Diabetes Mellitus**  
*William R. Kennedy, MD, Manabu Sakuta, MD, David Sutherland, MD, and Frederick C. Goetz, MD*
- 

- 489 **Computed Tomography of the Brain in Subacute Sclerosing Panencephalitis**  
*Nicolas S. Krawiecki, MD, Paul R. Dyken, MD, Taber El Gammal, MD, Robert H. DuRant, MA, and Andrea Swift, MS*
- 

## Brief Communications and Case Reports

- 494 **DA Strain of Theiler's Murine Encephalomyelitis Virus Induces Demyelination in Nude Mice**  
*Raymond P. Roos, MD, and Robert Wollmann, MD*
- 

- 499 **Reversible Visual Evoked Potential Abnormalities in Vitamin E Deficiency**  
*John A. Messenheimer, MD, R. S. Greenwood, MD, M. B. Tennison, MD, J. J. Brickley, PhD, and C. J. Ball, R EEG T*
- 

- 502 **Acquired Immune Deficiency Syndrome and Multiple Tract Degeneration in a Homosexual Man**  
*D. S. Horoupian, MD, P. Pick, MD, PhD, I. Spigland, MD, P. Smith, MD, R. Portenoy, MD, R. Katzman, MD, and S. Cho, MD*
- 

## Letters

- 506 **Epilepsy and Intelligence**  
*Stephen Shafer, MD, MPH*
- 506 **Reply**  
*John Rimmer, PhD, and Arthur L. Prenskey, MD*
- 

- 506 **Cortical and Subcortical Dementia**  
*Morris Freedman, MD, FRCP(C)*
- 507 **Y. Agid, MD, and M. Ruberg, MD**
- 508 **Reply**  
*Richard Mayeux, MD, and Yaakov Stern, PhD*
- 

- 508 **Useful Techniques in Essential Tremor**  
*William Koller, MD*
- 

## Regular Departments

- 510 **Books**
- 

**NO 6 JUNE 1984**

---

## Neurological Progress

- 511 **Molecular Genetics, Recombinant DNA Techniques, and Genetic Neurological Disease**  
*Roger N. Rosenberg, MD*
- 

## Original Articles

- 521 **The Functional Anatomy of Frontal Lobe Neglect in the Monkey: Behavioral and Quantitative 2-Deoxyglucose Studies**  
*Ruthmary K. Deuel, MD, and Robert C. Collins, MD*
- 

- 530 **Mechanisms of Recovery from Aphasia: Evidence from Serial Xenon 133 Cerebral Blood Flow Studies**  
*David S. Knopman, MD, Alan B. Rubens, MD, Ola A. Selnes, PhD, Arthur C. Klassen, MD, and Maurice W. Meyer, DDS, PhD*
- 

- 536 **Value of Computed Tomographic Scan in the Evaluation of Adult Patients After Their First Seizure**  
*Manuel Ramirez-Lassepas, MD, Robert J. Cipolle, PharmD, Luis R. Morillo, MD, and Robert J. Gummit, MD*
- 

- 544 **Chronicity of Hyponatremia as a Factor in Experimental Myelinolysis**  
*Michael D. Norenberg, MD, and Rebecca E. Papendick, BA*
- 

- 548 **Diagnostic Imaging of Herpes Simplex Virus Encephalitis Using a Radiolabeled Antiviral Drug: Autoradiographic Assessment in an Animal Model**  
*Yutaka Saito, MD, Richard Rubenstein, PhD, Richard W. Price, MD, Jack J. Fox, PhD, and Kyoichi A. Watanabe, PhD*
- 

- 559 **Focal Cerebral Ischemia in the Rat: Topography of Hemodynamic and Histopathological Changes**  
*George W. Tyson, MD, Graham M. Teasdale, MRCP, FRCS, David I. Graham, PhD, FRCPath, and James McCulloch, PhD*
- 

- 568 **The Protective Influence of the Locus Ceruleus on the Blood-Brain Barrier**  
*Sami I. Harik, MD, and Thomas McGunigal, Jr, BS*
- 

- 575 **Tissue Culture Demyelination by Normal Human Serum**  
*Donald H. Silberberg, MD, Margaret C. Manning, BS, and Alan D. Schreiber, MD*
- 

- 581 **Rapid Alterations of the Axon Membrane in Antibody-Mediated Demyelination**  
*Kyoko Saida, MD, Takahiko Saida, MD, Hisae Kayama, BSc, and Hiroshi Nishitani, MD*
-

- 
- 590 **Paraproteins in the Spinal Fluid of Patients with Paraproteinemic Polyneuropathies**  
*Marinos C. Dalakas, MD,*  
*and Nicholas M. Papadopoulos, PhD*
- 

- 594 **The Ontogeny of Seizures Induced by Leucine-Enkephalin and  $\beta$ -Endorphin**  
*O. Carter Snead III, MD, and Helen Stephens, BS*
- 

- 599 **"Locked-in" State Following Reye's Syndrome**  
*Suresh Kotagal, MD, Ursula Rolfe, MD,*  
*Kathleen B. Schwarz, MD,*  
*and Wilfredo Escobar, MD*
- 

## Brief Communications and Case Reports

- 602 **Azathioprine in the Treatment of Myasthenia Gravis**  
*Arnold S. Witte, MD, David R. Cornblath, MD,*  
*Gareth J. Parry, MD, Robert P. Lisak, MD,*  
*and Norman J. Schatz, MD*
- 

- 605 **Computed Tomography in Alexander's Disease**  
*Kevin Farrell, MB, Sylvester Chuang, MD,*  
*and Laurence E. Becker, MD*
- 

## Notes and Letters

- 608 **Neurological Complications of Thyrotoxicosis in the Elderly**  
*Tim Florin, MB,*  
*and Ronald S. Walls, MB, DPhil (Oxon)*
- 

- 608 **Brain Abscess: A Complication of Cystic Fibrosis in Adults**  
*Charles S. Rabkin, MD, and Martin J. Blaser, MD*
- 

- 
- 610 **Outcome in Neonates with Seizures: Are Chronic Anticonvulsants Necessary?**  
*Peter Gal, PharmD, Martha K. Sharpless, MD,*  
*and Henry R. Boer, MD*
- 

- 611 **Reply**  
*I. Bergman, MD, Michael J. Painter, MD,*  
*and Patricia K. Crumrine, MD*
- 

- 611 **Acute Hemorrhagic Leukoencephalitis: Diagnosis by Computed Tomography**  
*Robert T. Watson, MD,*  
*William E. Ballinger, Jr, MD,*  
*and Ronald G. Quisling, MD*
- 

- 613 **Conjugal Amyotrophic Lateral Sclerosis**  
*Karl O. Schwarz, MD*
- 

- 613 **Reply**  
*Ezio Paolino, MD, Enrico Granieri, MD,*  
*Maria R. Tola, MD, and Giulio Rosati, MD*
- 

- 613 **Incidence and Prevalence of Down's Syndrome**  
*Richard Mayeux, MD*
- 

- 614 **Reply**  
*Albert Heyman, MD*
- 

- 614 **Aphasia/Apraxia and Familial Aggregation in Alzheimer's Disease**  
*John C. S. Breitner, MD*
- 

- 615 **Reply**  
*Albert Heyman, MD*
- 

## Indexes to Volume 15

- 618 **Author Index**  
621 **Subject Index**
- 

## Regular Departments

- 616 **Books**
-

